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EMULSION COATING COMPOSITION CONTAINING A SYNTHETIC RESIN, WOOD FLOUR, AND PLASTER OF PARIS

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This invention relates to a coating composition to be applied over plaster, plaster board, stone, metal, wood or the like. More particularly, the coating composition of this invention may be applied as a relatively thick layer for filling holes or depressions in the underlying material, for smoothing out irregular, coarse or grainy surfaces, for filleting or otherwise changing the contours of various structures and for like purposes.

Coating compositions of the type indicated are known but suffer from one or more of the defects mentioned hereinbelow. Thus, some such coating compositions do not have the proper body or consistency of dry or set too rapidly for easy application. Many coating compositions, when drying after application as a heavy layer, tend to shrink or contract or crack or wrinkle. Other coating compositions are characterized by a coarse or grainy surface structure. Still other coating compositions, when dried, are not sufficiently hard or not sufficiently cohesive to withstand even a reasonable amount of handling or abrasion or mechanical impact without damage. Other coating compositions do not adhere well to the underlying surface and are easily detached therefrom. Still other coating compositions are too permeable to water or lacking in resistance against water, soap, certain of the commonly used organic solvent, acids, light or variations in temperature, with resultant deterioration or exposure to such agents.

We have now provided a coating composition adapted to be used for the above mentioned purposes and comprising a mixture of wood flour with plaster of Paris dispersed in an emulsion comprising a solution of a synthetic thermoplastic resin dispersed in water. Our novel composition can easily be applied as a heavy layer, and, when so applied, dries or sets due to two concurrent actions, viz. the setting of the plaster of Paris (with formation of gypsum) and the evaporation of part of the water and of the resin solvent. Such drying or setting takes place without shrinkage or distortion and the resulting coating is characterized by smooth, even texture and surface, strength, good adhesion, imperviousness and good resistance against water, soap, certain of the commonly used organic solvents, acids and many other desirable qualities.

It is, therefore, an important object of the present invention to provide an improved plastic coating composition that can easily be applied as a thick layer over an irregular or indented or coarse or grainy surface to form a strong and durable coating that is outwardly smooth or even instead of conforming to the underlying surface.

Another important object of the present invention is to provide a coating composition of the type indicated in the preceding paragraph characterized by imperviousness to water and good resistance against dampness, soaps, alkaline and acid agents, molds and various agents to which such coatings may be exposed.

A critically important feature of the present invention is the inclusion with the coating composition of both

plaster of Paris and wood flour or other equivalent finely divided cellulosic material. Wood flour, by itself and without the plaster of Paris, yields a coat that is too grainy, not sufficiently smooth and excessively soft. Plaster of Paris, by itself and without the wood flour, must be employed in large amounts (if the plastic coating composition is to have the required body and consistency), with the result that the dried or set coat will be lacking in strength or cohesiveness. Other materials than wood flour, such as clays, vermiculite, perlite and the like, do not yield satisfactory results, whether or not combined with plastic of Paris.

From 1½ to 4 parts (by weight) of plaster of Paris may be used for each part of wood flour. The preferred ratio is two parts of plaster of Paris for each part of wood flour.

Any of the commercially available wood flours may be used preferably of 100 to 200 mesh fineness.

The plaster of Paris should be free from fibrous material (wood or hair or the like), such as is sometimes incorporated with commercial plaster of Paris. Further, the plaster of Paris should include a retarder so that its setting time will range from about 2 to about 3 hours. Such retarders are conventionally used for the purpose indicated. One such retarder is made up of alkali treated proteinanceous material, in particular, hair or hides reacted with lime and then degraded with caustic soda. Since such retarders are well known, they are not described in detail in this application. The exact amount of retarder to be used will vary somewhat with the specific retarder employed, the origin and method of preparation of the plaster of Paris, the nature of the water added to the plaster to cause the plaster to set, the temperature at which setting takes place, and the like. The manner of adjusting the amount of retarder to secure the desired setting time being well known to those skilled in the art, there is no need to explain such adjustment herein. It may be noted, however, that about 6 to 10 lbs. of retarder is often added to 1 ton of plaster of Paris. The plaster of Paris is suitably ground to a fineness such that 75% of the plaster will pass a 325 mesh screen.

The synthetic resin forming a part of our novel coating composition is selected from the vinyl, acryl and styrene polymers and copolymers and mixtures thereof. Examples of such resins are: Vinyl chloride acetate copolymers of various molecular weights and percentages; poly vinyl acetate; poly vinyl chloride; the ethyl, n-propyl, n-butyl or isobutyl methyl methacrylate. Preferably, we employ a mixture of a relatively hard and non-tacky resin with a relatively soft and tacky resin, in order to render the coating composition suitably adhesive. By way of a relatively hard, non-tacky resin, we may use a vinyl acetate chloride copolymer, polymerized methacrylate or polymerized styrene. By way of a relatively soft tacky resin, we may use an acrylic ester-styrene-drying oil copolymer. Ordinarily, a preponderant amount of a relatively hard non-tacky resin is used along with just enough relatively soft and tacky resin to effect the desired adhesiveness. Naturally, the ratio between the two types of resin will vary according to the specific resins employed. The adjustment of this ratio, however, is within the skill of the art. When vinyl acetate chloride copolymer is combined with an acrylic ester-styrene-drying oil copolymer, we use from 5 to 10 parts (by weight) of the first mentioned resin in combination with from 3.5 to 6 parts of the second resin.

We can also employ one of the above disclosed relatively hard and non-tacky resins in combination with a plasticizer such as triglycol di-2-ethylbutyrate; butoxyglycol phthalate; tricresyl phosphate; or chlorinated paraffin. In such cases, enough plasticizer is added for effecting suitable plasticity, which of course will vary slightly